

**REMARKS**

Claims 11-20 are pending and under examination. Applicants respectfully traverse the rejections in the Office Action, where the Examiner:

(1) rejected claims 11-18 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Pub. No. 2002/0118916 (“*Lee*”);

(2) rejected claim 19 under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of U.S. Patent No. 6,396,984 (“*Cho*”); and

(3) objected to claim 20 as being dependent upon a rejected base claim, but indicated that it would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Regarding the 35 U.S.C. § 102(b) Rejection of Claims 11-18:**

Applicants request reconsideration and withdrawal of the rejection of claims 11-18 under 35 U.S.C. § 102(b) as being anticipated by *Lee*. In order to establish anticipation under 35 U.S.C. § 102, the Office Action must show that each and every element as set forth in the claims is found, either expressly or inherently described, in *Cho*. See M.P.E.P. § 2131. *Lee*, however, does not disclose each and every element of Applicants’ claims. Specifically, *Lee* does not disclose at least Applicants’ claimed “coupling waveguide ... comprising a tapered core of a substantially constant refractive index” and “receiving waveguide ... comprising a core of a substantially constant refractive index greater than the refractive index of the tapered core of the coupling waveguide,” as recited in claim 11.

The Office Action acknowledged that “*Lee* is silent as to the relative refractive indices of the waveguides.” Office Action, page 3. The Office Action then alleged that “[h]owever, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (see MPEP § 2112.01).” *Id.* According to

the Office Action, “Lee describes the claimed mode converter structure. Therefore, the claimed relative refractive index properties are presumed to be inherent.” *Id.* Applicants respectfully disagree.

Applicants respectfully direct the Examiner’s attention to MPEP § 2112:

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

...

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

In addition, referring to MPEP § 2112.01:

[T]he *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d at 1255, 195 USPQ at 433.

Contrary to the Office Action’s assertions, the structure recited in *Lee* is not “substantially identical to that of the claims,” at least because “Lee is silent as to the relative refractive indices of the waveguides,” as acknowledged by the Office Action. The relative refractive index properties recited in claim 11 are part of the claimed structure, because the refractive index and effective refractive index of each part of the claimed optical mode converter are an aspect of the material composition and geometry of the claimed device. *Lee* does not contain a sufficiently particular teaching of the materials or the geometry used in the mode

transformer 100 to enable a person of ordinary skill in the art to ascertain what particular refractive indices are necessarily present in *Lee*. In addition, the Office has not shown, and therefore should not infer, that the refractive indices and effective refractive indices of *Lee* *necessarily* have values that satisfy the claimed relationship.

Even assuming (but without admitting) that core 102 of *Lee* corresponds to the coupling waveguide recited in claim 11, and that core 108 of *Lee* corresponds to the receiving waveguide of claim 11, and even though *Lee* discloses that each of the cores 102 and 108 has a respective refractive index, it is not inherent in *Lee* that any particular relationship exists between the actual or effective refractive indices of the various components of *Lee*, and in particular, it is not inherent that the relationship recited in claim 11 is disclosed by *Lee*.

Referring to paragraph [0029] of *Lee*, the only disclosed relationships between the actual refractive indices  $n_1$ ,  $n_2$ ,  $n_3$  are that  $n_2$  is larger than  $n_1$  and  $n_3$ , and  $n_1$  is slightly larger than  $n_3$ . There is, however, no express or inherent constraint on index  $n_2$ , and therefore *Lee* does not expressly or inherently prevent selecting a material for core 104 such that the refractive index  $n_2$  of core 104 does not satisfy the relationship recited in claim 11. That is, index  $n_2$  may be a value such that the relationship recited in claim 11 is not met but the value still satisfies the disclosure of *Lee*. Therefore, it is clear that the refractive indices relationships are not inherently disclosed by *Lee*.

In addition, referring to paragraph [0033] of *Lee*, the only disclosed property of the effective refractive indices of cores 102 and 104 is that the effective index of the tapered portion varies gradually from the effective index of core 102 at one end of the tapered portion to the effective index of core 104 at the other end. Again, there is no express or inherent constraint on the values of either effective refractive index. Therefore, there is no express or inherent constraint on the difference between the first and second refractive indices, which is required by

claim 11. In particular, *Lee* does not expressly or inherently prevent selecting a material and geometry for either core 102 or core 104 such that the effective refractive indices of these cores do not satisfy the relationship recited in claim 11.

As such, the features of claim 11 which are not expressly disclosed by *Lee* (acknowledged by the Office) are also not inherently disclosed by *Lee*. The mere fact that these features may result from *Lee* in a given set of circumstances (without admitting that such is the case) is not sufficient to establish inherency. Therefore, the Office has not met its burden of showing extrinsic evidence making clear that the claimed relationship is necessarily present in the mode transformer 100 described in *Lee*, and that it would have been so recognized by a person of ordinary skill in the art.

Since *Lee* does not disclose each and every element of independent claim 11, *Lee* does not anticipate claim 11 under 35 U.S.C. § 102(b). Therefore, independent claim 11 should be allowable over *Lee*. Dependent claims 12-18 should also be allowable at least by virtue of their dependence from base claim 11, and because they recite additional features not disclosed in *Lee*. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection.

**Regarding the 35 U.S.C. § 103(a) Rejection of Claim 19:**

As discussed above with respect to *Lee*, and presented in the Request for Reconsideration filed May 14, 2010 with respect to *Cho*, Applicants respectfully submit that claim 19, containing similar recitations to claim 11, should also be allowable over *Lee* and *Cho*. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claim 19.

**Regarding the Objection to Claim 20:**

As discussed above, claim 19 should be allowable over *Lee* and *Cho*. Therefore, Applicants respectfully request withdrawal of the objection to claim 20 which depends from allowable base claim 19.

**Conclusion:**

Applicants request reconsideration of the application and withdrawal of the rejections and the objection. Pending claims 11-20 are in condition for allowance, and Applicants request a favorable action.

The Office Action contains a number of statements reflecting characterizations of the related claims. Regardless of whether any such statements are identified herein, Applicants decline to automatically subscribe to any such statements or characterizations in the Office Action.

If there are any remaining issues or misunderstandings, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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